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ART. I.—*Bartram Botanic Garden.* By ALEXANDER GORDON, Philadelphia; (to the Editor of the Genesee Farmer.)

MR TUCKER—In conformity with my promise to you when at Rochester in the month of May, I purpose occasionally sending for your pages such matter as I may deem worthy of notice. I flatter myself the following observations respecting the first botanical establishment ever attempted in America, its founder and his successors, with its present state in the scale of Botany and Horticulture, will be acceptable to many, particularly the gardening portion of your readers.

Bartram Botanic Garden is situated on the west banks of the river Schuylkill, about three miles from Philadelphia. It was established by that venerable and enthusiastic naturalist, John Bartram the elder, in the year 1720. The worthy founder of these gardens discovered in his early youth a love for philosophy and natural history in general. He was however particularly drawn to the study of botany, from considering the importance of vegetables in the practice of medicine, and their indispensable use in various departments of human economy. But at that time botany was but little attended to in America, and in the old world the works of the great Linnæus had not appeared; he had therefore no other aid in studying the great book of nature than his own persevering genius. His view in the establishment of the garden was to make it a deposit of the vegetables of the United States, (then British Colonies,) as well as those of Europe and other parts of the world, that they

might be the more convenient for investigation. He soon furnished his grounds with the curious and beautiful vegetables in the environs, and by degrees, with those more distant, which were arranged according to their natural soil and situation, either in the garden or on his plantation, which consisted of between 200 and 300 acres of land, the whole of which he termed his garden. The novelty of this horticultural scene attracted the notice of the ingenious and curious, and coming to the knowledge of Europeans, several scientific men in England, particularly of the Royal Society, united to encourage the founder to undertake journies towards the western frontiers, in order to discover and collect various non-descript productions in nature, particularly vegetables, that they might be sent to Europe.

From the American edition of Rees' Cyclopædia, I learn Mr Bartram corresponded with *Linnæus*, *Lord Petre*, *Sir Hans Sloane*, *Dr Fothergill*, and many other eminent men. The former said in one of his letters, that he (Mr Bartram) was the greatest natural botanist in the world. He employed much of his time in excursions through the provinces, from the shores of Lake Ontario to the source of the river St. Juan, in East Florida. He was appointed American Botanist to his Britannic Majesty George III., in which appointment he continued till his death in September, 1777, in the 76th year of his age. Mr B. was a native of Delaware county, Penn. John, the youngest son, succeeded his father as proprietor of the Kingsess Botanic Gardens, but they were chiefly under the superintendence of his brother, Mr William Bartram, well known in the literary world by his travels in East and West Florida, the Cherokee country, &c. &c., who accompanied his father on many of his extensive botanical tours, and who seems to have inherited his unwearied zeal and vigorous capacity for that sublime science. The fame of this gentleman extended to both continents; in his sphere he was one of the most useful men in America; his knowledge was acquired by incessant bodily labor; the fields of natural science in his days were unexplored, and he resorted to the study of nature where she unfolded her works to the senses as the only true source of knowledge. To this gentleman we are indebted for the discovery of many new and rare plants, and among others the *Franklinia Altamaha*, (Gordonia pubescens,) a beautiful tree so called in honor of Dr Franklin. At the solicitation and expense of

the celebrated Dr Fothergill, of London, he made excursions to the Floridas, and to the western parts of Carolina and Georgia, in search of rare and useful productions of nature, but chiefly of the vegetable kingdom, to which gentlemen he sent his collection of plants, dried specimens and drawings. The work already alluded to was the result of these travels. This work was published almost simultaneously in Germany, in Dublin, (Ireland,) and the United States.

A few minutes before the death of this enthusiastic admirer of nature, he wrote an article on the natural history of a plant, and in rising from his desk to take a morning view of the botanic grounds, he had only proceeded a few steps from the door, when he burst a blood vessel, which suddenly closed his useful life, July 22, 1823, in the 85th year of his age.

The gardens are now in the possession of Col. Carr, to whose indefatigable exertions, aided by that of Mrs Carr, the gardens owe their present celebrity, for they are the admiration of every visiter, whether native or foreigner. Mrs Carr is the daughter of John Bartram the younger, but to speak in just terms respecting her enthusiasm for plants, (which is only equalled by her success in their cultivation,) is a task I am incompetent to perform, for I am not possessed of words which could convey in the most remote degree the passionate fondness with which she toils among the plants, in every department, from the earliest dawn until darkness renders her operations impracticable. Mrs Carr's botanical acquirements place her in the very first rank among American botanists. Her knowledge of American plants is most extensive, not surpassed, if equalled, by any one in the United States. But, to this lady and her uncle, Mr William Bartram, the world is under another deep debt of gratitude, for it was to the friendly conversations and instructive communications of the latter that Alexander Wilson, my countryman, first imbibed, or at all events carried his passion to such an extent for the native birds of America. To the former (Mrs Carr) he was principally indebted for his knowledge of and his proficiency in drawing. To their combined efforts we are indebted for his American Ornithology.

In examining Bartram Botanic Garden, one characteristic feature will be obvious to the most inattentive observer, viz :—the large specimens of various trees planted by John Bartram, the elder, and

his son, William Bartram. While on a visit to the garden in the month of November, 1831, I was forcibly struck with their magnitude, (see Loudon's London Gardener's Magazine, vol. 8th, p. 284,) but then, and on several succeeding visits, I could not dedicate time to ascertain their exact dimensions; however, with the assistance of Mr. Carr, Jr. I have recently been enabled to gratify myself on this point, having accurately measured thirty distinct species, the dimensions of which are as follows:

No.		Circumference. feet.	inches.	Height. feet.
1.	Æsculus flava,	6	4	90
2.	Ailantus glandulosa, (25 years old,)	4	2	55
3.	Andromeda arborea,	3	10	60
4.	Bignonia radicans,	3		
5.	Buxus sempervirens—*vel variegata*,	2	6	25
6.	Castanea pumila,	2	9	
7.	Cercis canadensis,	3		35
8.	Chionanthus virginicus, (one limb of,)	2	6	20
9.	Cornus florida,	2	9	30
10.	Cupressus disticha,	23	9	123
11.	Cyrilla caroliniana,	2	1	
12.	Drospyros virginica,	5	7	70
13.	Gordonia pubescens, (Franklinia,)	3	8	52
14.	Gymnocladus canadensis,	5	2	80
*15.	Dirca palustris,	25	6	8
16.	Halesia tetraptera,	4	0	45
17.	Juglans divæformis,	4	6	70
18.	Magnolia accuminata,	6	3	80
19.	——— auriculata,	4	1	50
20.	——— tripetela,	3	0	35
21.	Morus rubra,	4	1	40
22.	Pinus microcarpa,	4	4	
23.	—— picea,	5	5	85
24.	—— resinosa *vel rubra*,	4	9	75
25.	Porcelia glabra,	1	10	30
26.	Quercus alba,	12	0	80
27.	——— heterophylla,	3	9	50

* Those marked with an asterisk were measured round the branches, and the whole for the circumference were measured about six feet from the ground

*28. Rhododendron maximum,	45	0	20
*29. Sturtia virginica,	60	0	20
30. Thuya occidentalis,	3	5	40

As before mentioned, the gardens are situated on the west banks of the Schuylkill river, about three miles from Philadelphia, and contain about eight acres of ground, compactly filled with the choicest ornamental trees, shrubs and herbaceous plants, properly located in their natural soils and altitudes as far as practicable. The mansion and green houses stand on an eminence, from which the garden descends by gentle slopes to the river. From the mansion are distinctly seen the winding courses of the Schuylkill and Delaware, with the broad spread meadows and cultivated farms up and down those streams. Beyond this there is an uninterrupted view of the Jersey shore, from the eastern to the southern horizon. The whole comprehends an extensive prospect, rich in the beauties of its scenery and endless in diversity.

The exotic department in the garden is very extensive, and comprises the following houses:

	Length. feet.	in.	Width. feet.	in.
1. Green house,	50	0	30	0
2. Orange house, &c.	30	0	14	0
3. Geranium house,	65	0	11	6
4. Propagating house,	21	6	11	10
5. Rose house,	49	0	13	6
6. New Holland and Stove,	68	0	14	0
7. Geraniums, roses, &c.	26	6	10	6
8 & 9. Rose Pitts,	93	0	7	0
10. Cactus house,	20	0	8	0

No expense is spared in procuring every desirable novelty for the exotic department, and in the Geraniacæ, Camellicæ, and Cactæ, this garden is particularly rich. Independent of the Botanic Garden, there is a very extensive Nursery connected with this establishment, occupying upwards of twelve acres, compactly filled with choice fruit trees, ornamental trees, shrubs, &c. Col. Carr has, by the most indefatigable exertions, imported the choicest varieties of fruit trees from the different horticultural establishments in England, France, Germany, &c. Col. C. not only imports scions of all that is rare and valuable, but also trees for immediate sale, the de-

mand for fruit trees in the western country being much greater than the existing establishments can supply. The unwearied zeal of the proprietor renders his nursery inferior to none in the United States, as respects the variety of fruits, ornamental trees, shrubs, &c. The whole establishment does great credit to the owner, who is universally respected, but not more esteemed for his laudable exertions and correctness in the various departments of his establishment, than for his amenity as a gentleman.

Immense qnantities of seeds, collected in this garden from the old specimens, are annually exported to Europe. The garden is the resort of the Philadelphians, the casual visiter, and in fact of the tourist in general—they command universal admiration. In fact, the great variety they contain of the choicest American shrubs—the enormous magnitude of many, and the extensive collection of exotics, must prove a source of attraction to the amateur, and an interesting field for the scientific. But to convey an idea of the estimation in which these gardens are held, I may here mention that the Philadelphia and Baltimore rail road, now constructing, as originally planned, would have gone through the very centre of the gardens, and sacrificed the most splendid of the specimens, but the rail road company, with a desire to preserve them entire, altered the route at an additional expense to themselves of 10,000 dollars. Such a magnanimous act was highly meritorious, and deserves the gratitude of an American public.

Col. Carr corresponds with many scientific gentlemen in Europe, and in North and South America, consequently the garden is a depot for all that is rare and valuable.*

* It is, I understand, the intention of Col Carr to dispose of the gardens, green houses, &c. Should he meet with any gentleman who would preserve them entire, or if the Philadelphia Horticultural Society would purchase them, he would make considerable sacrifice. To any gentleman devoted to botany, what an opportunity here presents itself, and it is sincerely to be hoped that either the society will purchase them. or that some amateur will step forward and possess himself of this rich and charming establishment. A. G.

Art. II.—*Formation of Dew.*

One of the operations of nature most important to the growth of plants, and without which, in some parts of the world, vegetation could not be carried on at all, is the formation of dew. The deposition of dew was formerly a subject involved in much mystery, but the researches of science and investigations in meteorology have thrown much light on the matter, though it cannot as yet be considered as freed from all difficulties. According to the best modern authorities, "the phenomena of dew admits of an easy and elegant explanation, from the well known effect of the radiation of caloric from bodies. This radiation constantly taking place in all bodies, it is obvious that the temperature of any body can remain the same only by receiving from another source as many rays as it emits. In the case of the earth's surface, so long as the sun remains above the horizon, it continues to receive, as well as to emit heat; but when the sun sinks below the horizon, no object is present in the atmosphere to exchange rays with the earth, which, still emitting heat into free space, must consequently, experience a diminution in its temperature. It thus becomes not only many degrees cooler than in the day time, but also cooler than the superincumbent air; and as the atmosphere always contains watery vapor, this vapor becomes condensed on the cold surface; hence the origin of dew, and if the temperature of the earth is below 32°, of hoar frost." This explanation appears very satisfactory as far as it goes in accounting for the deposition of dew, but there are some facts connected with the subject which do not seem to be fairly embraced in this or any other general solution.

What are the facts connected with the formation of dew? Observation shows us that the times in which dew is deposited most copiously, are those in which the morning and middle of the day are filled with vapor, but which, with all the agitation of the atmosphere, gradually disappears as the sun declines in the west. Vapor is composed of minute vesicles or bubbles, and these collected into masses from clouds. Vapor could not rise as it does, visibly in the case of steam, and invisibly in the case of evaporation from the surface of water or the earth, unless the atmospheric fluid with which these vesicles are filled was specifically lighter than common air.

The most plausible supposition, and one which would seem to be justified by the nature of the phenomena, is, that the fluid which fills these vesicles is the ethereal substance called the electric fluid; and consequently each minute particle of vapor may be considered as a charged Leyden jar, and a mass of them when collected into clouds as an immense electrical battery. The researches of science have shown most conclusively the identity between the electric fluid and caloric, and hence it is seen that any cause which should abstract the caloric or electricity of the particles or masses of vapor, would at once effect their condensation. When the caloric is abstracted from a particle of vapor, the watery envelope forms an invisible drop, and is deposited in the shape of dew; when it is abstracted from a mass of vapor, as by a flash of lightning from the clouds, these separately invisible particles are united and drops of rain are the results. Much of the difficulty which has been found in divesting the formation of dew of its mystery has arisen from the fact that electricity and caloric have been usually considered as different things; whereas, by admitting they are one, most of the difficulties vanish at once, and the deposition comes readily into the class of recognized phenomena.

In perfect accordance with the grand and universal law of nature, that an equilibrium of caloric or electricity must be maintained, a law which is unquestionably the cause of all circulation, and will probably be found that of all motion, the caloric of the surface of the earth thrown off by radiation, must be supplied from some other source; and this source, in the absence of great declination of the sun, can only be found in the caloric combined with the vapor of the atmosphere. Substances that radiate or throw off caloric the most readily are usually the soonest covered with dew, as glass, water, &c. Every one who has paid attention to the formation of dew must have noticed that the first appearance of moisture visible is a minute but rapidly increased drop on the upright pointed extremity of the leaves of grass, or similar plants, and this first appearance is usually some time before the setting of the sun. Much however is depending on the purity of the atmosphere and its freedom from all currents of air. The experiments of Hare and Silliman on electric currents with the voltaic battery, we are inclined to think throw light on this deposition of dew on the points of erect grass. In these experiments it was found that in the passage of the

electro-magnetic currents when pencils of charcoal were used for the connecting points, a deposition of matter gradually took place on the negative point, while a corresponding loss was sustained by the positive one. In supplying from the atmosphere the caloric lost by radiation, the grass points serve as conductors to the ethereal fluid; and, as at the instant of contact between the attracted particle of vapor and the point of the grass, the caloric leaves the moisture which had served as its envelope, the latter is condensed and deposited on the point where the separation takes place; and as the current is constant; the accumulation of the globule of dew is, of course, rapid, until the equilibrium between the atmosphere and the earth is restored.

After the formation of dew has commenced, any agitation of the air by winds, or the formation of clouds, will at once arrest its progress, as clouds prevent the radiation of caloric from the earth and its consequent cooling. A knowledge of this fact has enabled gardeners to preserve plants from frost that otherwise must have perished; and in the early settlement of the western counties of this State, the formation of artificial clouds, as they may be termed, by the condensation at evening of the immense volumes of smoke that arose from the lands that were being cleared of their timber, was found to be an effectual safeguard to such late crops of corn as were endangered by frosts. Indeed it is found that the cooling of the earth necessary to the deposition of dew, rarely takes place while the thinnest strata of vapor is visible in the atmosphere. Young plants in the garden may be preserved from frost by spreading over them any thing, however flimsy, that will prevent the radiation of the earth, as a simple mat, or a box with a millinet or muslin covering, or even a linen cloth, provided that the covering does not touch or rest upon the plants. Vegetables or trees growing near walls, houses, or high fences, are sometimes saved by the partial check these afford to radiation; and every farmer who plants his orchard knows that corn or potatoes planted under the trees will remain green long after those around them have been killed. In this case the spreading top or foliage of the tree intercepts the radiated heat and returns a part of it to the earth by the electric currents that exist in all vegetables.

The rapidity with which dew forms, about sundown, may be considered a pretty sure criterion of the degree of cold which will pre-

vail during the night; and, of course, the necessity of precaution, or otherwise, may be determined upon in season to save such plants as require protection. The formation of ice in warm climates furnishes a curious proof of the radiation of heat. In Bengal, and principally in the vicinity of Calcutta, some three or four hundred persons, previous to the introduction of New England ice by Yankee enterprise, found a constant and profitable employment during the summer months, in the manufacture of ice, for the use of the European residents. Broad, shallow, unglazed, earthen pans, were placed on dry straw, and when water was poured into them, ice of the thickness of half an inch was sometimes formed in a night; and those nights, in which dew was deposited most copiously, were always found to produce the thickest ice, while clouds or wind interrupted it entirely.—*Genesee Farmer.* W. G.

Art. III.—*On the Culture of the Onion.* By Mr Towers.

Season *of planting.*—In February or very early in March, a number of small onions of the variety called Spanish or Reading, should be collected, the bulbs not to exceed an inch and a half in diameter; those of one inch will do very well, but they ought to be round, flattish, perfectly formed, and not in a growing state. It must be remembered that each of the onions should produce two, three, or four new ones, and the calculation might be founded upon this probable return. The upper soil of the bed, if it be dry, should be sprinkled, and then beaten with the flat side of a spade to a firm and level surface; the angles of the squares to be nine inches apart. Some persons might prefer to stretch the line, and to plant row after row, the onions to stand in quincunx or alternate order; but whatever be the mode adopted, the surface should not be broken up, and an onion is to be placed on the soil, at every angle of the squares, or at an equal distance, along the line, and firmly pressed down till it be half immersed. Care must be taken also to let the root be fixed straight, so as to send its fibres perpendicularly downwards; the growth of the plant will then from the first be quite upright, and the bulb will be fixed firmly in its place; whereas, if the bulb

lie on one side, it is very liable to be displaced. Worms are troublesome visitors on these occasions; therefore, soot, air-slacked lime or wood ashes should be dusted freely over the surface; the operator must also be on the alert to refix any bulb which may be disturbed.

If the weather be early dry and parching in March, water may be safely given by making holes, sloping diagonally, from the centre of the intervals towards the lines of bulbs, but to at least four inches below them, and in these, water may be freely poured. In frosty weather, of course, nothing of the kind will be attempted, but in dry warm seasons, too much water cannot be given to the under strata; the surface soil, on the contrary, should be as dry as possible.

Under favorable circumstances, growth will be rapidly established, and the gardener will have to observe many interesting and beautiful phenomena. Leaves will at first be developed, but these are not now the organs of nutrition to the parent bulb, from the coated layers of which they indeed proceed. A system of foliage is indeed vitally required, but its energy in the present instance, can be diverted from that course which nature ordains it to take. In this second year, the leaves are destined to nourish the progressing organs of fructification, and it will be observed that each bulb sooner or later, produces a flower stalk, with its umbel of flowers concealed within their spathe at the summit. As soon as this head at the point of the flower stalk, shall be distinctly seen, it must be pinched or cut off. Upon this operation depends the entire success of the plantation; for if the flowers develop, and the seed vessels enlarge, the bulbs will have no successors. A second, perhaps a third, flower sheath may appear, and must be immediately obliterated; this done, the leaves become stronger, and their laborated juices are instantly diverted, and called in aid of those germs of young bulbs which lie in embryo, and would perish with the parent, were the seed bearing processes allowed to be carried to any considerable extent.

After the final excision of the flower stem, a singular change, or rather a new development, takes place in the bulb. From being soft and spongy, owing to the previous exhaustion of the layers, they begin to re-acquire solidity,—that is, they appear to acquire it, for the phenomenon is in reality dependent upon the progressive, but

almost secret, production of one or more new bulbs. Nothing can be more impressive than this mysterious development; its course can scarcely be traced. I do not dare to assert, that a practised eye, gifted with a peculiar quickness in discerning physiological mutations, may not mark and detect those which are wrought in the formation and the enlargement of the new onions; but I do say, that among above ninety plants which I obtained last summer, neither I myself, nor a youth who planted the old bulbs, could trace the progress of the new ones. I may be excused for quoting the passage which I wrote in my diary, because it may be considered more simply true to the then observed facts, than any thing I could now pen from recollection.

"As the leaves advanced, the bulbs became soft and exhausted; as flower heads arose, they were pinched off and gradually new bulbs formed, two, three, and four to each, the old bulb and skin vanishing in a way not to be detected."

I admit I have adopted this mode of planting but once, and, therefore, may have been in some degree misled. A future experiment will perhaps lead to more correct observation. I hope, however, that numbers may be induced to inquire for themselves; they will assuredly be recompensed by a very excellent crop of good onions, of a medium size, either in June or July. Mine, of 1835, was retarded by the extreme drought and piercing nights of May, and I had not attended to the previous preparation of the bed. I have expressly selected the Spanish or Reading onion for this summer crop, because it is mild and pleasant in flavor, and may be grown to greater perfection at the season; the process is worthy of the variety, and the variety is adapted to the process. The summer onions do not keep very long, nor is the Spanish a long keeper at all; hence particularly improper for the full winter crop, which ought to be hardy and of higher flavor. I might have chosen the *Tripoli*, which produces the largest bulbs, so large, indeed, that Mr Knight assured me he had grown several bulbs that weighed more than two pounds each, but it is very apt to decay. Many gardeners affect the variety termed the underground or *potato* onion; but the process I have described furnished, I think, an excellent substitute for it, especially as the flavor of the Spanish is far more delicate than that of the underground bulb. I claim none of the merit of discovering the foregoing method of multiplying the bulbs;

but am certain that if practised by any, it is known to very few persons, and my remarks will tend to diffuse the knowledge of it.

Seed Crop.—These fine large onions may be raised pure to their originals, by planting imported bulbs in a warm situation, exposed to the sun. The season might be the same as that of planting for a summer crop, and the soil a rich, mellow, sandy loam, well manured. The foregoing process for bulbs is adapted to the culture of seeding onions, with this especial exception, that the flower heads must be encouraged, and each step supported by a stake, as it advances in height. I am inclined to believe that were the imported bulbs of the Tripoli, Spanish, and Portuguese planted, one in a large pot of very rich soil, about the first week of January, protected under glass in a common garden pit or vinery, not in action, and finally transplanted, with the ball of fibres entire, when all danger from severe frost had ceased, a month would be gained, which, in the north, might be found of some consequence, as the seed would be matured by an August sun.—*Canterbury* (*Eng.*) *Journal.*

ART. IV.—*On the Systems of Cropping Kitchen Gardens adopted by the best private and commercial gardeners; with an attempt to reduce them to fixed principles.* By W. D. S.

THE subject of cropping the ground in kitchen gardens embraces the preparation of the soil, the insertion of the seeds or plants, their after culture, the gathering of the crop, and the system according to which one crop is made to succeed another. As the discussion of all these points, however, would involve the repetition of what is already well known to every gardener, the article now submitted to the reader, and for which his indulgence is entreated, is limited to what is properly called cropping, or the succession of crops. Crops in kitchen gardens, are put in the ground according to three distinct plans or systems, which may be termed successional cropping, simultaneous cropping, and permanent cropping.

Successional Cropping, is that in which the ground is wholly occupied with one crop at one time, to be succeeded by another crop, also wholly of one kind: for example, onions to be followed by winter turnips, or potatoes to be followed by borecole.

Simultaneous Cropping, is that in which several crops are all coming forward in the ground at the same time: for example, onions, lettuce, and radishes, sown broadcast; or peas, potatoes, brocoli, or spinach, sown in rows.

Permanent Cropping, is where a crop remains on the ground several years; such as sea-kale, rhubarb, asparagus, strawberries, &c.

To these modes might be added, *mixed ligneous and herbaceous cropping*, such as growing herbaceous crops among gooseberries, currants, raspberries, and other fruit shrubs, and among fruit trees. The practice of growing culinary crops among fruit shrubs is, however, nearly exploded in the best gardens, on account of the injury done to the shrubs when they are young and small, by the roots and shade of the culinary crops, and of the injury done to the culinary crops when the shrubs are grown up, by the shade and confinement which they produce. For the same reasons, cropping between trees is by no means desirable in small gardens, where the trees must necessarily be at no great distance from each other; but in the case of very large gardens, such as those of commercial gardeners, where trees are planted in close rows at 20, 30, or 40 yards apart, so as to shelter the ground, the cropping may be carried on in the spaces between rows of trees, on the principles which regulate successional, simultaneous, or permanent cropping, in ground where there are neither trees or shrubs.

The object to be attained by a system of cropping is that of procuring the greatest quantity and the best quality of the desired kind of produce, at the least possible expense of labor, time, and manure; and, in order that this object may be effectually obtained, there are certain principles which ought to be adopted as guides. The chief of these is to be derived from a knowledge of what specific benefit or injury every culinary plant does to the soil, with reference to any culinary plant. It ought to be known whether particular plants injure the soil by exhausting it of particular principles; or whether, as has been lately conjectured by De Condolle, and, as some think, proved, the soil is rendered unfit for the growth of the same or any allied species, by excretions from the roots of plants; while the same excretions, acting in the way of manure, add to the fitness of the soil for the production of other species. The prevailing opinion, as every one knows, has long been, that plants exhaust the soil, generally, of vegetable food, particularly of

that kind of food which is peculiar to the species growing on it for the time being. For example; both potatoes and onions exhaust the soil generally, while the potato deprives it of something which is necessary to insure the production of good crops of potatoes, and the onion of something which is necessary for the reproduction of large crops of onions. According to the theory of De Condolle, both crops exhaust the soil generally, and both render it unfit for the repetition of the particular kind of crop; but this injury according to his hypothesis, is not effected by depriving the soil of the particular kind of nutriment requisite for the particular kind of species; but by excreting into it substances peculiar to the species with which it has been cropped, which substances render it unfit for having these crops repeated. Both these theories, or rather, perhaps, hypotheses, are attended with some difficulty in the case of plants which remain a great many years on the same soil; as, for example, perennial-rooted herbaceous plants and trees. The difficulty, however, is got over in both systems: by the first, or old theory, the annual dropping and decay of the foliage is said to supply at once general nourishment, and particular nourishment; and by the second, or new theory, the same dropping of the leaves, by the general nourishment which it supplies, is said to neutralize the particular excretions. It must be confessed that it is not very obvious how general nourishment, dropped on the surface of the soil, can neutralize the excrementitious matter deposited many feet beneath the surface; as in the case of long rooted herbaceous plants, like the saintfoin, lucerne, &c.; and deep rooting trees, such as the oak, &c. Nevertheless, we find that these plants will remain a longer period on the same soil than others, the roots of which never go to any great depth beneath the surface; such as the fibrous-rooted grasses, the strawberry, &c., and the pine and fur tribe. We mention these things to show that, though it is not yet determined which is the true theory, yet that the fact of plants injuring or diminishing the fertility of the soil, both generally and particularly, does not admit of a doubt.

In the absence of principles founded on whichever of these hypotheses may be true, recourse is obliged to be had to rules drawn from the experience and observation of those who believe in the old theory. These rules, as adopted by the best gardeners, are as follows:

Crops of plants belonging to the same natural order or tribe, or to

the natural order and tribe most nearly allied to them, should not follow each other. Thus, turnips should not follow any of the cabbage tribe, sea-kale, or horseradish.

Plants which draw their nourishment chiefly from the surface of the soil should not follow each other, but should alternate with those which draw their nourishment in great part from the subsoil. Hence, carrots and beets should not follow each other; nor onions and potatoes.

Plants which draw a great deal of nourishment from the soil should succeed, or be succeeded by, plants which draw less nourishment. Hence, a crop grown for its fruit, such as the pea; or for its roots or bulbs, such as the potato or the onion, should be followed by such as are grown solely for their leaves, such as the common borecole the celery, the lettuce, &c.

Plants which remain for several years on the soil, such as strawberries, rhubarb, asparagus, &c. should not be succeeded by other plants which remain a long time on the soil, but by crops of short duration; and the soil should be continued under such crops for as long a period as it remained under a permanent crop. Hence, in judiciously cropped gardens, the strawberry compartment is changed every three or four years, till it has gone the circuit of all the compartments; and asparagus beds, sea-kale, &c., are renewed on the same principles.

Plants, the produce of which is collected during summer, should be succeeded by those of which the produce is chiefly gathered in winter or spring. The object of this rule is, to prevent two active and exhausting crops from following each other in succession.

Plants in gardens are sometimes allowed to ripen their seeds; in which case two seed bearing crops should not follow each other in succession.

These rules, and others of a like kind, apply generally to the three different systems for the succession of crops; and they are independent altogether of other rules or principles which may be drawn from the nature of the plants themselves; such as some requiring an extraordinary proportion of air, light, shade, moisture, &c.; or from the nature of the changes intended to be made on them by cultivation, such as blanching, succulency, magnitude, &c. We shall now notice the different systems separately.

Successional Cropping.—The plants best calculated for this mode

of cropping are such as require, during almost every period of their growth, the fullest exposure to the light and air; and as remain, also, a considerable time in the soil: these are, the turnip, the onion, the potato, the beet, the carrot, &c. If any of these crops are raised and brought forward under the shade of others, they will be materially injured both in quality and quantity; though, at the same time, while they are merely germinating, shade will not injure them. Hence, successional cropping may be carried on in breadths of 20 feet or 30 feet, between rows of tall-growing articles, without injury; which approximates this manner of cropping to the simultaneous mode, which, wherever the soil is rich, is by far the most profitable.

The simultaneous mode of Cropping is founded on the principles, that most plants, when germinating, and for some time afterwards, thrive best in the shade; and the tall-growing plants, which require to receive the light on each side, should be sown, or planted, at some distance from each other. Hence, tall-growing peas are sown in rows 10 feet or 12 feet apart; and between them are planted rows of the cabbage tribe; and, again, between these are sown rows of spinach, lettuce, or radishes, &c. Hence, also, beans are planted in the same rows with potatoes or with cabbages, (an old practice in the cottage gardens of Scotland;) and so on. The great object in this kind of cropping is, to have crops on the ground, in different stages of growth; so that, the moment the soil and the surface are released from one crop, another may be in advanced state, and ready, as it were, to supply its place. For this purpose, whenever one crop is removed, its place ought to be instantly supplied by plants adapted for producing another crop of the proper nature to succeed it. For example, where rows of tall marrowfat peas have rows of broccoli between them, then, the moment the peas are removed, a trench for celery may be formed where each row of peas stood; and between the rows of broccoli, in the places where lettuces were produced early in the season, may be sown drills of winter spinach.—*Loudon's London Gardeners' Magazine.*

Art. V.—*On the Potato, particularly the Early Varieties.*—By A. Forsyth.

My respected father cultivated this root during a period of half a century; and I have prepared sets, planted and cultivated them, after his instructions, under his eye, and since that time, for a period of nearly twenty years. I have also had it in my power to mark their culture in different parts of Britain, (some 500 miles between,) in various soils, and under various circumstances, with as various success; and, notwithstanding all the experiments that have been made (as detailed in the *Horticultural Transactions*, and other papers on this subject to which I have had access,) it does not appear to me that any of the writers have reached the root of the evil.

In the first place, then, according to our theory, there is a radical error in the practice, much in vogue among the growers around London, of taking up the tubers intended for sets before they are quite ripe: another practice, no less pernicious, in my opinion, is, the keeping of them in large heaps, with moist soil round them, or in warm sheds; and another evil is, the growing of potatoes for years in the same kind of soil. A friend informs me that, in the black shallow soil of Dartmoore, in Devonshire, extensive potato plantations are made, the sets for which are every second or third year procured from the farmers where the soil is red or yellow loam, But to come to the point; and first, then, I will relate how we discovered what I consider a superior method of keeping the sets. On taking in a stock of corn, which had been built on a rustic platform of wood, about four inches clear of the soil, some beautiful specimens of potatoes were found in an admirable state of preservation (it being late in the season) in the soil; or I may rather say dust, for it was so dry that it would have drifted in the wind. This was taken as a hint; and subsequent practice confirmed the idea, that to keep potatoes in the highest state of perfection (that is, perfectly dormant, and yet plump and full flavored,) they require to be taken up in dry weather, when they are perfectly ripe, (that is, when the strings and the tubers part freely,) and deposited in layers, with dry soil between; say one layer of potatoes, three inches deep; one inch of soil; three inches more of potatoes; then six inches of soil; and over this a water proof thatching, erected on props six inches high, that the winds may act freely on the soil under the thatch.

Gardeners, requiring but small quantities, should look out for seed potatoes in summer, from soils of a different nature to that which they intend to crop; and should have them brought home as soon as they are ripe, and get them deposited as above detailed; they will thus obtain sound perfect sets, uninjured by fermentation or unwholesome damps. To prepare the sets, tubers, about the size of a hen's egg, may be cut in two, putting the crown sets by themselves, which should be planted for the earliest crop. Immediately after the sets are cut, let them be planted: no drying is necessary. Indeed, I should not allow a seed tuber to be exposed to the air, either in the autumn or spring, for a single hour, if I could prevent it. In planting, dig the ground one full spade or spit deep (if previously trenched, so much the better.) When two spits have been dug all across the quarter, let the line be strained on the dug ground, and a drilled chopped out about six inches deep, in which a layer of any half-rotten manure may be put, such as old mushroom beds, half-decayed leaves, fermented stable dung, &c.; on which (not under it) place the sets, eyes uppermost, four inches apart, and then let them be covered with the broken soil in the trench; after which the planter may proceed to dig for another row, which may be two feet apart. A great many systems of planting potatoes are practised round the metropolis, many of which, to say the least of them, are very unworkmanlike; planting with the dibber is a detestable practice in a garden. The best early sorts that I am acquainted with are, the ash-leaved kidney and the early manly; but any of the early sorts, if true, will succeed for all ordinary purposes. No vegetable is more easily forced or forwarded than the potato, if allowed plenty of light and air, and kept from frost: it will bear a strong heat, and thus suit itself to any forcing structure, from the pine stove at 70°, to the matted bed in the open border, that is only defended from the frost by coverings. A slight hot bed is generally preferred, of dung, leaves, or tan, say three or four feet deep; with a stratum six inches deep of any light soil, in which the sets are inserted about three inches deep, in rows fifteen inches by five inches. Time may be gained by forwarding the sets in a box of soil, placed in any of the forcing houses, and planting them out, under some protection, after they have pushed and begun to root. There are various ways of getting young potatoes (as in cellars, and in boxes of sand) from large coarse varieties; but, as the

produce is both unwholesome and unpalatable, I should rather caution against the using of them, than recommend the practice. The earliest potatoes, in the open ground, may be planted about the fifteenth of March; and the latest before the first of June.—*Gardener's Magazine.*

(For the Horticultural Register.)

Art. VI.—*The City Flower Garden.*

Among the many comforts in possession of the citizen, that of the "City Flower Garden" may be considered of the first order, as the pleasures derived from it are of a character which embraces *health, pleasure* and *moral rectitude.*

Any intelligent person must be aware that the continual working of ground in cities, in a great measure, rectifies the impure vapor that is always present from smoke, decaying leaves, and other substances, and that the more any part of city gardens are worked, the more healthy and pure is the nature of the atmosphere, and hence the utility of often working flower gardens in cities, independent of its better appearance to the eye of the observer. Again, we are informed by botanists and vegetable physiologists that trees and plants respire and perspire in a manner that is congenial to the health of the animal kingdom, and hence may infer the double utility of trees and shrubs in cities, when their cooling shade is taken into consideration.

The pleasure derived from a fine collection of flowers requires no comment, only, that the more varied and perpetual the flowering, the greater is the gratification to the observer. The moral lesson that can be obtained from flowers also forms another fine characteristic in the flower garden; for flowers not only please the eye and gratify the passing observer, but contain a beauty in their structure in the most minute parts and coloring, that conveys a pleasing and natural lesson to the most accurate and intelligent observer; and every thing to please and nothing to offend, either the morals or nicest observer, is the true characteristic of the flower garden.

There is nothing that I am acquainted with relative to Horticulture that has been more generally improved than the city flower

garden, which is now becoming general, and will no doubt ever improve—for it is an appendage, when well managed, that always gives pleasure to all kinds of persons, and the inmates of the dwelling. And what can be more grateful to the merchant, or man of any professional business, than to recreate, for a short time, in a well selected collection of flowers, neatly arranged and cultivated? Every one either engages his attention by its fragrance, color, or or peculiar character, and many, as the rose, white lily, &c. embrace every thing to attract our most ardent desires.

In closing these remarks, I shall throw out some few hints relative to obtaining the proper method of selecting and managing a flower garden, which will, perhaps, be useful to some of your readers.

The plan of the garden, be it either large or small, generally pleases when it is so constructed as to give a variety in the design —formality, though often the leading feature, seldom gives that ease that is requisite; the planting of the ground should also bear the nicest consideration, by which I mean, that such shrubs and plants should be selected that will form a pleasing contrast, and appropriate in the different places assigned to them. And, lastly, such plants should be chosen that will give a succession of flowers from the early part of the spring till the winter closes the flowering season. The first of these may be effected by any person of taste, and the latter, which is the selecting, can never be better and more accurately done than to visit nurseries and gardens, where such plants are for sale, and select plants at different seasons, in flower, when their true character and portrait can be seen.

JUNIUS.

ART. VII.—*A Preventive of the Blight in Pear Trees.* By HENRY N. WATKINS, Prince Edward.

THE preventive is the simplest imaginable — it is not to prune the tree, or break up the ground underneath them; but, on the contrary, to let the ground be trampled. The facts, from which I come to the above conclusion, are the following:

1st. There were in my grandfather's yard two pear trees, which

have been bearing trees from my earliest recollection, say forty years. I am now the occupant of his houses and yard. These two trees are now as healthy as they ever have been. The yard has always been trampled by calves and horses.

2d. There was a row of four trees in a lot adjoining the yard, which was occasionally cultivated. These trees have blighted, more or less, whenever the lot has been cultivated. Two of them have died with the blight; the other two have been several times very much injured by it, but since I have ceased to cultivate the lot, they have been flourishing trees.

3d. I grafted in the year 1821, about twenty pear trees. They remained in the nursery until 1824; they were then planted in a lot adjoining my yard, which lot was cultivated three years in succession in tobacco. Most of the trees during those three years, blighted more or less — some blighted within a foot of the ground. I then levelled the ground on which they were planted, and moved my fence so as to enclose them in the yard. Such as had been nearly destroyed by blight, I enclosed by a pen of rails, in order to keep off the calves which graze the yard, until the trees had grown sufficiently high not to be injured by them. These twenty trees are now all healthy, and there has been no appearance of blight, since I cultivated the lot, except in one tree that was enclosed by one of my servants in a garden, in which he cultivated vegetables. That tree was blighted and died.

I would recommend that pear trees be planted in a rich soil (I would prefer the site of an old dwelling) — that they be ploughed and worked a few years, even at the risk of blighting; and after that, that they be neither pruned nor ploughed. If they require manure, let it be applied to the surface. Ashes I think an excellent manure. Let the pear orchard be grazed by small cattle, until the trees are of sufficient size to admit of being grazed by larger, without injury. I think it would be proper to keep down coarse weeds, briers, sprouts, &c. I am well convinced that there are some hardy native pear trees, that may be pruned and ploughed without being subject to blight; but I feel confident that most of the finest kinds of pears, would thrive best under the treatment I have described. I know, too, that there is a difference in soils, and that the same mode of treatment may not suit all situations. But, those who have not succeeded in raising pear trees, might try my method. My

opinion is, that the blight is produced by the excessive flow of sap, and that pruning and fallowing produce that effect. If, however, I had pear trees growing on hard poor land, I would fallow and manure; preferring rather to risk the blight, than let the tree die of poverty. But, when I had sufficiently manured, I would then cease fallowing.—*Farmers' Register.*

Art. VIII.—*Hedges — Osage Orange.*

Hitherto, attempts to construct live fences in this country have mostly failed, in consequence of the want of adaptation in the material to the circumstances of soil and climate. The thorn flourishes well in the humid climate of England, but in our hot and dry seasons its growth becomes feeble and stinted. The cedar and some other plants, though very ornamental, constitute weak barriers against the inroads of stock.

So many unsuccessful attempts to grow hedges, especially in the States north of us, have induced a general prejudice against that species of enclosure. Every person, however, is disposed to admit, that if a suitable plant for the purpose could be introduced, it would be an important acquisition. At present, each farm is obliged to have from a fifth to a third of its contents in timber, in order to maintain its enclosures. If efficient hedges could be substituted, the advantages would be obvious. A large portion of good land, now unproductive, might be brought into cultivation; and a great amount of labor might be saved, which we are now compelled to bestow on the present system of fencing — to say nothing of the improvement in the rural appearance of the country, which would be effected by doing away our unsightly log fences, and rearing hedges in their places.

It is gratifying, therefore, to be assured, that in one of our native plants; namely, the *maclura* or Osage orange, we are likely to realize this desirable object. The maclura is a deciduous tree, growing indigenously in Arkansas and Louisiana — is perfectly hardy in this latitude, and even as far north as Boston. For a number of years it

has been cultivated in the grounds of a few private gentlemen, and in some of the large nurseries. It is only recently, however, that its value has been appreciated, or any pains taken to propagate it extensively. In its native *habitat*, it attains to the size of a tree of the second or third class; but in this latitude, its altitude is very moderate, seldom rising to the height of fifteen feet. Its great merit consists in the spreading manner of its growth, the denseness of its branches, and the armature with which they are furnished. Planted in hedge-rows, the maclura would never become unmanageable on account of its size — at the same time, its growth is sufficiently vigorous to make a fence in three, four, or at most, five years, from the seed. It may be asserted with safety, that on land of tolerable fertility, the labor and expense of perfecting a system of hedges, would not be greater than to keep our ordinary enclosures in good order, for the time required to construct them. When completed, this heavy item in every farmer's account would thenceforth be expunged.

The *maclura* is readily raised from the seed. Unlike those of the thorn, they require no preparation — on the contrary, they vegetate with certainty in two or three weeks after planting. Under tolerable care, the seedlings will grow two feet or more in height the first season; after which, they are fit to be removed from the nursery rows to the place designed for the hedge. I raised a number of plants the past year from the seeds, the produce of a tree growing in my garden, now eight or nine years old.

For an individual to engage in the business in earnest, it would be best for him to obtain the seed from the Southwest, rather than to purchase the plants from a nursery man. A few dollars would procure enough of the former, and pay all the expenses of transportation, to set a long line of hedge. The preferable mode would be to have them brought in the berries, from which they might afterwards be picked without much trouble. Fifty berries would yield at least a pound of seed, and a pound contains from eight to ten thousand grains. It is the practice to place the sets from twelve to fifteen inches apart, in a single row. These facts will enable any person to form a correct judgment of the number necessary to plant any given length of hedge.

But it is not to be expected, whatever may be the adaptation of any plant to the purpose of hedging, that it will, under a long time, be brought into general use. The most palpable improvements are

slow in being adopted. A considerable portion of our country is moreover too much impoverished to admit of the successful rearing of hedges. They belong eminently to a state of cultivation where taste and industry are measurably combined. But if we have worn out fields, we have also fine districts of country, where their pleasing effects, as well as utility, would be most manifest. What an air of neatness and improvement they would impart to the finely cultivated farms on James river, both above and below Richmond, to those also on the Rappahannock, the Roanoke, and in many other sections of the State that might be designated with equal propriety. In most of these places, the lands are so valuable that there is now a great deficiency of timber; and, from necessity, they are therefore almost exclusively devoted to grain. Along the lines of canals also, where permanent fences are obliged to be maintained, there would be a great advantage in planting hedges at once. The idea that when fairly established, they will never need removal, would inspire a degree of security which cannot be felt by those persons who are in the habit of patching up decayed fences, and calculating the value of a rail in resisting the depredations of stock.—*Virginia Farmer's Register.*

Art. IX.—*Shade Trees.*

It was Lord Bacon, we believe, who said that "a tree in full leaf was a more majestic object than a king in his coronation robes," and as he was a man competent in every respect to form a correct opinion of the matter, he may undoubtedly be considered right. We, untilled plebeian farmers, whose optics have never expanded at the sight of a throne or a crown, or looked on that animated piece of clay called a king, can perhaps form but a faint idea of the splendors of royalty, but we do know there is nothing in nature that combines more grace and beauty, than the wide spreading foliage of a majestic tree in the "leafy month of June." Gentle or simple, savage or civilized, all men, unless those in whom every trace of taste and sentiment is extinct, look on trees, whether in their native forests, or growing under the culturing hand of man, with a feeling of ad-

miration and delight. The freedom and ease with which their tapering and beautifully proportioned columns spring into the air — the regularity and finely adjusted curves of their arching branches — the broad and overshadowing roof formed by the intermingling masses of foliage, form a whole to which the most costly piles of human architecture are mean, and which constitutes a temple worthy of His worship who designed and created such examples of surpassing beauty.

We have long considered it as wonderful, that while this feeling of admiration of trees is so universal, it should have had so little influence in inducing men to assist nature in arranging and perpetuating this beauty. We seem to take a pleasure in destroying the last remnants of our once mighty forests, and as if their destiny was connected with that of the red man who once dwelt beneath their branches, with one hand we are pushing him beyond the bounds of civilization, and with the other dashing to the earth the dark woods that furnished him shelter and food. We lay the axe to the root of our magnificent forest monarchs with as little reluctance as if they were the growth of a year, and seem to forget that we in an hour can undo what nature requires centuries to perform; we seem to imagine that the world will end with ourselves, and that there will be no coming generations to require timber and fuel, and objects of grandeur and beauty to admire. That such a feeling should prevail among those who, like most of the farmers in our new countries, have been taught to consider the trees which covered their farms a nuisance, and the destroying of them a blessing, is not so passing strange; but that men, whose life has been spent in villages or cities, should, when domiciliated in the country, be so willing to cut down, and so unwilling to plant, is truly wonderful.

A man would almost as soon plead guilty to insanity, as confess to a non-perception of the beauties of spring, or a want of pleasure in highly cultivated grounds, shady avenues, or leafy whispering groves; yet because a woodland, or an avenue, or a cool shady walk, will not, like Jonah's gourd, spring up in a night, every one deems himself privileged to defer planting trees; and hence our naked dwellings and unprotected fields, our villages without coverts or shrubbery, and our cities with their ranges of brick and stone, but with their streets and squares unplanted and unornamented. There is a mistaken notion prevalent on the time it will take a tree to be-

come useful or ornamental. There are few young men who, if they would plant a tree, or a number of trees, would not live to take a pleasure in the work of their own hands, and find in the beauty they have imparted to their premises, if not in the increased amplitude of their purses, a full compensation. — *Genesee Farmer.*

Art. X.—*Morus Multicaulis.*

"We observe by an extract from a letter to the editor of the Albany Silk Worm, from a gentleman in Troy, N. Y. that his Morus Multicaulis trees have withstood the late winter in that quarter, unprotected in the open fields, and come out undamaged even to the top bud."—*Farmer and Gardener.*

Remarks. This intelligence must be gratifying to those who contemplate the culture of the Morus Multicaulis tree with the intention of manufacturing silk. Many doubts have existed respecting the capacity of the Morus Multicaulis to withstand our common winters, and especially the last winter, which for severity, sudden changes of weather, and destructiveness to trees in general, has exceeded that of any other winter perhaps within half a century. The apple, peach, quince, plumb, pear, cherry, and even the sturdy forest tree, and especially the oaks of one year's growth, have been much injured, and in many instances killed. The white mulberry, especially seedlings, have suffered severely. One person, within my knowledge, has lost nearly one hundred thousand seedling trees, although they were covered with earth and other substances abroad. We cannot go to the extent of the gentleman in Troy—but thus much we believe, that the Chinese mulberry has not suffered so much as any other tree. Among the many kinds of mulberry now cultivated, the Canton Multicaulis has withstood the late winter better than any other, and when the Manilla and Canton have stood side by side, or secured by the same protection, the Canton has come out unscathed. Next to the Canton, the Chinese seedling has been less injured than the Manilla Multicaulis, when both have had similar protection. We advocate the method of protecting the Multicaulis roots from the severity of winter by cutting them down every autumn to one or two buds above the ground, and covering

the stump with earth, or turf, or other substances; this method not only tends to preserve the root, but to increase the number of stalks and foliage the succeeding autumn. Standing water, however, or a body of ice, which, when melted, shall form a pool of water about the roots, is certain destruction to this kind of mulberry. The last winter was very unpropitious to trees, and where the stump of the Multicaulis had the earth drawn over the stump like a potato hill, of course a corresponding excavation was made in the vicinity of the root, where the water could settle and penetrate and destroy the tender fibres, and of course damage or destroy the whole, especially when the water became alternately frozen and thawed. We wish the gentleman of Troy had told us whether the earth about his mulberries was left level in the autumn, or whether the earth was drawn up about the root.

In the Connecticut Valley, winter before last, trees were left out during the winter, and only some portion of the tops killed, and that part which had not formed hard wood, the earth made level about the roots—whereas the last winter, to protect the root, the earth was drawn about the root as above described, leaving hollow places about each, and in some instances suffered severely. Under these circumstances it is suggested, that when roots are left out all winter, that the ground be made level about them, and if any covering to the stump be needed, let a small piece of turf, chip manure, forest leaves, or other substance, be spread over the stump.—*Northampton Courier.*

Art. XI.—*Bone Manure.*

As some of your readers may be desirous, personally, to test the efficacy of Bone Manure, and yet be hindered by not being provided with the requisite drill, I have thrown a few hints together—the result of my own experience, and of information derived from good practical men—which may tend to encourage them in proving the utility of this valuable manure.

Bone manure should be placed within about two inches of the surface; and owing to the small quantity used per acre, the seed should be brought as near to it as possible, without immediate con-

tact, which is better to avoid. There is, of course, no mode so eligible to effect this, as a drill, working clean and well, and depositing, from separate hoppers, the dust and the seed : but experience has proved, that a result closely approximating to this, may be obtained by very simple means.

The soil being first reduced to its proper state for the reception of the turnip crop, in lieu of a last ploughing, let the land be laid up in banks ; the bone manure to be cast on the land by broadcasts, followed by the roller, which will, of course, crumble in sufficient earth to cover the manure, without, by any means, obliterating the furrow : then run a single chep-drill, with the turnip seed in the furrow and cover the whole with a light harrow.

Some recommend depositing the bone with a shake box ; and one farmer, of much experience in the use of bone manure, recommended me simply to sow dust and seed broadcast, and then cover the seeds, and lay the whole into furrow by the operation of the plough afterwards : but wherever it is intended to use bones extensively, nothing is so well as to have a proper drill for the purpose, which will repay its first cost again and again. My observations, therefore, are intended for those only who wish to make a first trial, and are unprovided with more efficacious means.

The value of an article can always be found by its extended use : and if we take this as our criterion, I know not where we can find any article, the use of which has become so extensive, or that has so increased in price, within the last twenty years. Before that time, bones were comparatively valueless ; being used only in the manufacture of porcelain, smelling salts, ivory black, &c., and brought only a trifling price per ton. They are now imported, from all quarters ; in many places, prohibitions and duties are levied to prevent their export ; (see France and Belgium :) and they obtain about four times the price they did formerly ; and yet, at the enhanced value, the use and manufacture of bone manure has increased, and continue to increase in all quarters.

Its price at present, in the north, where its use is chiefly known, is, I believe, twentysix shillings per quarter, the fine ; and twentythree shillings the coarse : and it is still the cheapest manure for turnips that can be found, as it bears mixing, in moderate proportions, with good vegetable mould, denshan ashes, soot, fine cinders, &c. Care should, however, be taken, that this admixture is not

already done to your hand; for which your best, and indeed, only security, is the respectability of the merchant.

To this cause is frequently to be attributed the cases of failure we sometimes meet with, although this again may be caused by the soil not being suitable, putting the manure too deep, or uncongenial seasons.

Frequently bones are used too sparingly, to allow us to expect to see much of their effects after the first year; but even sixteen bushels per acre have been evident not only in the turnip, but as well in the barley, and seeds succeeding; and if the price did not prevent the application in large quantities, as was the case in the first introduction of this manure (forty and fifty bushels per acre and upwards,) we should perceive a lasting benefit derived to the land from a liberal use of this the most lasting manure known.—*Canterbury Journal.*

Art. XII.—*Influence of the Winters from* 1834 *to* 1837, *on Vegetation.* By Sidney W. Andrews.

[Mr Sidney W. Andrews, of Montague, a gentleman of an inquiring mind, has furnished us with the following, as the result of his observations relative to the destructive effects of the last few winters, on forest and fruit trees.—*Greenfield Gazette*]

The winter of 1834–5 had a more serious effect upon the vegetable kingdom than any preceding winter I have noticed for the last thirty years. It may safely be said, that one fourth of the fruit trees in this region were destroyed, and the forest trees maimed and retarded in their growth. Very few peach trees survived, and the frost was so severe that in many instances, the bark of the apple trees were started, and the wood of young trees split open to the heart—the branches of older trees, such as survived, in the spring put forth sickly shoots, and the grain produced during the season was not more than one sixth of that of the preceding year. I noticed the white oak, which belongs to the hardest class of wood, shot forth its bud very late in the season;—in some instances which came under my observation, the bud from the time it began to swell, to the time that another was set for the succeeding year was

only ten days, the shoot being not half the length of that produced in 1834. The sassafras was mostly killed;—the locust, butternut, and other soft woods, where they survived, were very much retarded in their growth. The winter of 1835–6 was favorable for the roots of trees—the great depth of snow, keeping them warm, the frost having penetrated but a few inches into the earth on the opening of winter; but the spring opened bad, the snow lay long on the ground, and the season continuing cold, and vegetation not having recovered the shock given it the winter of 1834–5, the growth was very small. The winter of 1836–7 was unfavorable for vegetation. The frost in many places having penetrated from four to six feet deep, and continuing in the ground in many places until the early part of June, we may anticipate a loss, rather than a gain in vegetation, the present season.

Three more such winters as the three last which we have experienced, would nearly annihilate our fruit trees, and we might calculate on a great loss in our timber lands. The growth of 1835–6 was not equal to that of 1834, and it will require many years to repair the loss sustained by the three last winters. I examined this spring the heart of some locust saplings, of the four last years' growth, and found them to be black and spongy; and I have reason to suppose that had they been left, and cut down twentyfive years hence, they would have been found greatly decayed. Will not the woodman fifty years hence, find the timber less valuable than we do at the present day? But should the axe and the frost continue to lay waste as they have done the last few years, and the same apathy continue for its cultivation, the woodman will find no employment fifty years hence. It is to our forests that we have been indebted for two hundred years for our fuel and our shelter; and has it not been a source of wealth to New England? Regardless of those who must follow us, we unsparingly destroy what nature has given us. Had the aborigines possessed that determined hostility to the forests that we have shown, these settlements would not have had a being.

Art. XIII. — *Massachusetts Horticultural Society.*

Saturday, July 1, 1837.

An adjourned meeting of the Society was held. The President stated that the principal business was to organize concerning the Anniversary.

On motion of Mr Walker, it was voted that a committee of five be chosen to take into consideration the expediency of an Address and Exhibition of Fruits and Flowers, on the next Anniversary, — and the following gentlemen were chosen on that Committee:

Mr Samuel Walker, Mr Benjamin V. French, Col. Marshall P. Wilder, Mr Charles M. Hovey, Mr. Joseph Breck.

Capt. Alexander Parris, and Mr Samuel Hunnewell, were admitted subscription members. Adjourned to the next Saturday, 11 o'clock.

E. WESTON, Jr., *Rec. Sec.*

EXHIBITION OF FRUITS.

By J. L. L. F. Warren, Esq., of Brighton, — Methven Castle Strawberries, very large and beautiful, and of the most productive kinds. Also, fine specimens of Cucumbers.

For the Committee.

WM. KENRICK, *Chairman.*

EXHIBITION OF FLOWERS.

Our tables were this day decked with fine specimens of some of the gayest of Flora's productions. We hope our friends will send us a regular supply during the season of Flowers. We promise on our part to do all in our power to show them to the greatest advantage. Among the specimens this day exhibited, we noticed some *new seedling plants*, from the garden of Thomas Lee, Esq., of Brookline; *Dahlias*, from J. C. Howard, Woodland, Brookline; *Roses*, from Hawthorn Grove, Dorchester, by Mr John Donald, gardener to Col. M. P. Wilder; and also, some fine specimens by Mr John A. Kenrick, of Newton; *Seedling Pinks*, by Col. Wilder, and Messrs. William Miller and Samuel Walker, of Roxbury. Some of Mr Miller's Pinks were fine, and deserved a name.

Dahlias, — From J. C. Howard, Woodland, Brookline.—Queen

Adelaide, Boot's fine purple, Marshall's velvet, Foster's incomparable, all very fine specimens for the season.

From S. Lee, Esq.—Rhododendron maximum, Kalmia latifolia, Magnolia glauca.

Verbascum compactum, Cleome spinosa, Lupinius polyphillus, Lychmachsia dubia, Leptosyphon densiflora, Nemophilia insignis, Madia splendens, Penstemon, Stenactis speciosa, Sallandia bicolor, Lasthenia Californica.

By John A. Kenrick. — Pæonies, Whilleji, Humei, Fragrans, — roses variety.

Bouquets, — by Messrs. William Kenrick and S. Walker, containing many fine specimens of herbaceous plants.

For the Committee.

S. WALKER, *Chairman.*

SATURDAY, JULY 8, 1837.

EXHIBITION OF FRUITS.

By the President, Hon. E. Vose, Dorchester.—Two boxes of Tartarian and White Bigareau Cherries, and a box of Methven Castle Strawberries.

By James L. L. F. Warren, Brighton.—Three boxes of Methven Castle Strawberries. The specimens above were large and perfect.

For the Committee.

B. V. FRENCH.

EXHIBITION OF FLOWERS.

By the Messrs Winships of Brighton. — Specimens of flowers, the product of seed collected by Prof. Nuttall, while on his recent excursion to Columbia River and California.

Phaulia California, Colinsia bicolor.

Dahlias variety. — Agripina, Russell's Maculata, Countess of Liverpool, Hanover Stripe, Emperor of Yellows, Daniel O'Connell, Dwarf Lilac, Picta formosissima, Royal William, Beauty of Chestnut Grove, Springfield Rival, Sable Queen, [both very fine,] Sir Walter's Scarlet Auratia, Purpurea, Lady Livepool, Miss Ramsden.

By Thomas Lee, Esq., of Brookline. — Rhododendron maximum, Kalmia latifolia.

Dahlias, — Thorburn's White, Columbine, New Calypso, Le Brilliant.

Verbascum compactum, Digitalis neroso, Madia splendens, Leptosyphon densiflora, do. androsaecus, Malva, Lasthenia Californica.

Climbing Tea or Double Ayreshire Rose, Marie Leonidas do, Narsette do.

By Dr J. C. Howard, Woodland, Brookline. — Dahlias var.—Foster's Incomparable, Boot's fine purple, Smith's do., Squibb's yellow, Queen of Wirtemburgh, Marshall's velvet.

By Col. M. P. Wilder of Dorchester. — A variety of Seedling Pinks, and a fine collection of New French Roses, among which we noticed Bobelina, Hybrid Camuset, Rose le Sage, Pallagiea, and Ball of Snow.

By Mr Samuel R. Johnson, of Charlestown. — Rose Triumph de Arcole, and Phlox Drummondi.

Fine Bouquets from Messrs Hovey & Co., of Cambridge, William Kenrick of Newton, and Samuel Walker of Roxbury.

S. Walker of Roxbury, also exhibited some specimens of Ranunculus Asiaticus, and seven varieties of Seedling Pinks, which he has named as follows:

Walker's Claudius, do. Mary Louisa, do. Estelle, do. Col. Wilder, do. Othello, do. Nealensis.

For the Committee.

S. WALKER, *Chairman.*

A meeting was held. The Committee appointed at the last meeting to consider concerning the Anniversary, reported that its was expedient to notice the same by an exhibition and address. A Committee of Arrangements was then chosen, consisting of the following gentlemen:

Mr Samuel Walker, Mr Isaac P. Davis, Mr Samuel P. Grosvenor, Col. Marshall P. Wilder, Mr E. Weston, Jr., Mr. Benjamin V. French, Mr D. Haggerston, Mr Charles M. Hovey, Mr Jonathan Winship, Mr Joseph Breck, Mr J. E. Teschemacher, Mr W. Kenrick, Robert Treat Paine, Esq., Maj. Henry Sheafe. Mr Samuel R. Johnson, Mr S. Sweetser, Mr Thomas Lee, Mr R. Manning, Dr J. C. Howard, Mr P. B. Hovey, Mr T. G. Fessenden, Mr L. M. Richards, Mr John A. Kenrick, Mr William E. Carter, Mr J. L. L. F. Warren.

Voted, To choose a Committee to write to some gentleman of science, to deliver an address—and the following gentlemen were made this Committee: Mr J. P. Davis, L. P. Grosvenor, E. Weston, Jr.

Voted, That the Library Committee be directed to procure the latest edition of Loudon's Hortus Britannicus, for the use of the Chairman of the Flowers Committee.

Messrs. C. & A. J. Downing of Newbury, N. York, were admitted members of the Society.

Adjourned to this day, two weeks, at eleven o'clock, A. M.

E. WESTON, Jr., *Rec. Sec.*

SATURDAY, JULY 15 1837.

EXHIBITION OF FRUITS.

Raspberries, — from Mr Thomas Mason's Vineyard, Charlestown, — White Antwerp. Also, beautiful red Raspberries, called Grapes, from their hanging in clusters — being a new seedling.

Gooseberries, — from J. L. L. F. Warren, Brookline, Roaring Lion, and one other variety.

Apples, — of last year's growth, from B. Guild — Pearmain, Russet, and one other kind, in as perfect a state of preservation as they were in January.

Tomatoes, — ripe, from S. Sweetser, Cambridge.

For the Committee.

L. P. GROSVENOR.

EXHIBITION OF FLOWERS.

There was much to admire, and many admirers, at our Rooms this morning. Our friends spread our tables with many *charming things*.

Messrs Winship exhibited *fine* varieties of the Passion flower, all of which were fine specimens, and some of them extremely beautiful: double flowering Ayrshire Rose, sometimes called Climbing Tea Rose; Œnothera glauca; Martagon lilly; Silene Virginica; Staphelia variegata, and Collinsia atrophylla, from California, by Prof. Nuttall.

By Charles Hood, Esq. — Liriodendron tulipifera.

By Col. M. P. Wilder. — Geraniums, Roses, Mimulus, Grandiflora and Schizanthus retusus.

By Dr J. C. Howard. — Fine Dahlias: the specimens show they are highly cultivated. There were other plants from Mr Howard, but we have mislaid our minutes of them.

By Thomas Lee, Esq. — Dahlia: var. Columbine; its color is splendid, but it lacks the other good qualities to make a good flower.

By Mr Thomas Mason. — Dahlias: var. King of the Whites, Dennisii, Matilda, Bunker Hill, &c. Roses, Carnations, and some very fine specimens of Scabiosa.

The Messrs Hovey displayed good taste in the arrangements of their bouquets, which contained many good, although not rare, specimens. It gives us pleasure to see nature and art thus united.

Bouquets from Messrs Sweetser, Kenrick and Walker. Seedling Pinks; var. Walker's Cushingtonia, do. Othello, do. Claudius.

For the Committee.

S. WALKER, *Chairman.*

SATURDAY, JULY 22, 1837.

EXHIBITION OF FRUITS.

The tables of the Society were well filled to-day with a variety of fruits. The Gooseberries in particular we have never seen look finer. They were very large and perfectly free from the mildew, which has been so destructive to the fruit in former years.

The Downer Cherry exhibited by Mr Downer, who originated this variety, was excellent fruit, large and of rich flavor. The specimens were from the original tree, which, Mr Downer informs us, has never failed to produce a good crop of fruit.

From J. G. Thurston, Lancaster. — very large Gooseberries — not named.

From J. L. L. F. Warren. — late scarlet Strawberries, desirable as a late variety. Large and handsome Gooseberries of the following sorts: Washingtonian, Lancaster Lad, and Fair Maid of Perth. Mr Warren also exhibited a fine head of early Cauliflowers.

From J. T. Buckingham. — beautiful specimens of the red and white Antwerp Raspberries, and Champagne pale red Currants.

From Mr. Mason, Charlestown. — seedling grape Raspberries, large and fine. Also, white Antwerp Raspberries, and several varieties Gooseberries, all very large.

Russet Apples in good preservation, from the farm of J. Mackay, Weston.

For the Committee.

P. B. HOVEY, Jr.

EXHIBITION OF FLOWERS.

From Jos. Breck & Co. — Dahlias: Coreopsis, variety atrosanguinea. Superb striped Marigolds; seedling Delphiniums.

From Mr J. R. Johnson. — Perpetual Roses, var. Triumph of Luxemburg, Triumph d'Arcole, Countess of Albemarle, and some fine Carnations.

By Thomas Mason of Charlestown. — Bouquets, Dahlias and specimens of other fine things. We noticed among his Dahlias, Village Maid, Picta, Dennisii, King of the Whites and the Globe. Nerium? This was a new variety to us. If our friend Mr. Mason will furnish us with a list of his new specimens, he will oblige us.

By Mr Sweetser. — Nerium, two varieties, both double; one highly scented and fine shape. A variety of other flowers.

From Dr J. C. Howard, Woodland, Brookline. — Dahlias: var. Brown's Ophelia, Boot's fine purple, Globe, Queen Adelaide, Squibb's Yellow, and Prince George.

From Col Wilder. — Dahlias: var. Lord Liverpool, Well's Dictator, Lady Fordwich, Douglass Criterion, and Barrett's Susannah.

By S. Walker. — Carnations and other flowers.

This day the Messrs Winship presented Carnations: Yucca filamentosa; Passion flowers, and a variety of Dahlias; some of them very good; but the season has not yet arrived to expect *prime* specimens. When it does, we anticipate to see the Village Maid, the Salem Beauty, and *other beauties* from the garden of the Messrs Winship of Brighton.

For the Committee,

S. WALKER, *Chairman.*

An adjourned meeting of the Society was held. On motion of Mr Walker, the following gentlemen were added to the Committee of Arrangements.

Mr Russell of Mount Auburn, Mr Mason of Charlestown, Mr. D. Murphy of Roxbury, Mr Cheever Newhall, Mr Nathaniel Daven-

port, of Milton, P. Sawyer, Esq., of Portland, Jacob Field, Roxbury, A. D. Williams, Samuel Pond, J. P. Bradlee.

Mr Davis of the Committee appointed to select some gentleman of science, who could favor the Society with an Address — reported that Hon. William Lincoln of Worcester, has accepted the appointment. The report was unanimously accepted.

Mr Caleb Eddy was chosen a subscription member. Adjourned to this day two weeks.

E. WESTON, Jr., *Rec. Sec.*

Art. XIV.—*Miscellaneous Articles.*

Strawberries.—Every body loves this most delicious of fruits. In milk, with cream, and for preserves, it has but few equals, and no superior. Good strawberries gratify several of the senses at once, and combine, what in some cases are widely separated, health and pleasure. Strawberries too are easily cultivated, and, with a little pains in procuring early and late varieties, they may be enjoyed in perfection for a long time. Yet little as is the cost or trouble required to enrich a garden with a plant of this fine fruit, few it seems are willing to undertake it, and deprive themselves and their families of this wholesome and agreeable fruit rather than spend the requisite yearly half-day in digging and planting vines. Still, men who will not procure a strawberry vine for their garden, will permit their children to ramble over their own and their neighbors' meadows, trampling down the grass, acquiring predatory habits, and doing other injuries, besides spending far more time than would be required to produce an abundant supply of berries at home.

But perhaps some will say they have tried vines in the garden, and found that though they produced plenty of flowers they bore no fruit, and of course they gave up the bed as worthless. Very likely this may have been the case, for strawberries are of that class of plants which, in the language of the oldest botanists, produce male and female flowers, or flowers which do not produce fruit as well as those that do. Every one has noticed in the common strawberry of the fields, patches of vines that flower abundantly but produce no fruit, and so it is with the garden strawberry. Observation,

however, shows that the non-bearing flowers are usually much the largest and fairest, while those that produce the fruit are comparatively small, and the flower leaves or petals curled; and this distinction may be taken advantage of by any one, however ignorant he may be of the botanical nature of flowers. The best way, and the one that will effectually guard against disappointment in selecting bearing plants, is to mark the best bearing roots in such a manner that no mistake can occur when the proper season for transplanting arrives, which is either very late in the fall, or as early in the spring as the state of the garden will admit.

When once the strawberry has been transplanted, and placed in the plat where it is to remain, the only care required is to keep the ground clean, and free from weeds; and to cut off the runners that shoot out from the vines, either by pinching them off with the thumb and finger, or clipping them with a pair of scissors. With these precautions, and the occasional digging over the ground between the rows of the plants, and manuring with fine well rotted manure, a strawberry bed will last for years, affording the best of fruit, and producing it in quantities surprising to one who has not tested its bearing qualities. Our advice then to the farmer is,—to plant a supply of strawberries in his garden—to send his children to school—and by all means, if he does not wish at mowing time to be vexed in spirit, or meet the maledictions of his neighbor, to keep his 'little ones' out of all meadows whatever."—*Western Agriculturist.*

Boil your Garden before you Plant it. — In order to kill the eggs of insects which may be in the soil — the larvæ or the insects themselves which may do mischief, it has been found an excellent plan to drench the bed to be planted with scalding hot water. A friend informed us that a neighbor has for a number of years been in the habit of boxing up his beds snugly with a board, sunk on each side a few inches and projecting above it a few inches, and then pouring scalding water over every part of it. By this management he has never been troubled with grubs. This year he neglected so doing, and his garden has been assailed with insects marauders and nearly destroyed. For small plats of ground this mode may do well, but it would be no small job to *boil* a large one. — *Maine Farmer.*

QUINCY MARKET.

[Reported for the Horticultural Register.]

APPLES, Old,	barrel	6 00	
New,	peck	40	50
Dried,	pound	06	08
ALMONDS, (Soft shelled)	do.	7	8
(Hard)	do	4	5
BLUEBERRIES,	quart	25	
BLACKBERRIES,	do.	25	
BEETS,	bunch	6	
BEANS, String,	peck	17	25
Shell,	quart	25	
CABBAGES,	dozen	37	50
CAULIFLOWERS,	a piece	12	25
CARROTS,	bunch	6	
CUCUMBERS,	dozen	12	
CHERRIES,	quart	12	
CURRANTS, (Red and White)	do.	6	8
(Black)	do.	12	
CORN, (Green)	dozen	37	
FILBERTS,	pound	3	4
GOOSEBERRIES,	quart	12	
LETTUCE,	head	3	
LEMONS,	dozen	25	37
LIMES, (pickled)	quart	37	
ORANGES,	do.	67	
ONIONS,	bunch	6	
POTATOES,	bushel	67	75
PEAS,	do.	50	75
PINE APPLES,	hundred	5 00	10 00
PEARS,	peck	1 00	
PEA NUTS,	bushel	1 25	
RASPBERRIES,	box	25	
STRAWBERRIES,	do.	31	
SQUASHES, (Long Warted)	dozen	12	
(Early Scollop)	do.	12	
(West India)	pound	3	4
TOMATOES,	dozen	37	50
TURNIPS,	bunch	6	
WATERMELONS,	each	25	50
WALNUTS, (English)	pound	5	6

We have never seen a greater abundance of vegetables at this season of the year in market than is now exhibited, nor of better quality. Potatoes almost the staff of life, are getting quite plenty. The luxury, Tomatoes, are beginning to appear in considerable quantities, but it is said they are mostly from New York. Green Corn appeared today for the first time this season in the Stall of J. Miller. New Apples and Watermelons from Virginia, and new apples from this vicinity are to be found in abundance. All kinds of small fruit and especially Gooseberries, are very fine and plenty. We noticed a few Old Apples in excellent state of preservation, but in small quantities. Lemons and Oranges are scarce, and hardly to be obtained by the box; arrivals of fruit are daily expected. The first Shell Beans for the season are offered today at the Stall of Tooms & Staples.

Boston, July 29, 1837.